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Marine Physical Laboratory

Localization Performance Study

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the Office of Naval Research
Contract N00014-89-D-0142 (DO#8)
Principal Investigator: William S. Hodgkiss

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LOCALIZATION PERFORMANCE STUDY

Principal Investigator: W.S. Hodgkiss

Marine Physical Laboratory
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Final Report
Office of Naval Research
Contract N00014-89-D-0142 (DO#8)
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Objective:

Provide NOSC data from the July 1989 Swallow float experiment. Carry out simulations investigating the effect of bandwidth and sensor location on localization performance.

Background:

In July 1989, MPL carried out a Swallow float experiment in deep water west of Pt. Conception, CA. Extensive environmental and bathymetric data was collected in support of the experiemnt.

Summary of Results:

The primary thrust of this project was to begin an effort aimed at performing matched field processing (MFP) on data from sensors which might be located anywhere in the water column. Both simulations and the analysis of experimental data were included.

Data from the July 1989 Swallow float experiment was made available to NOSC and providing assistance in the analysis of that data was a major priority in this project. Of particular interest was performing matched field processing on the signatures of nearby ships. It was found that this is extremely difficult to do. Uncertainties in the geoacoustic characteristics of the bottom coupled with a rapidly changing geometry between a given ship and the sensors are suggested as reasons for the difficulty in obtaining better MFP results.

Extensive simulations were performed in parallel with the Swallow float data analysis. These were beneficial in developing an understanding of what the ambiguity surface should look like when the bottom characteristics are correctly modeled and the source ship is not moving.